Los Angeles Trade Tech. Jr. College
Course: Electronic Technician
Instructor: R.H. Oeffinger

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Teaching Plan

Introduction

This material covers the first year of the course. The contents has been divided into three sections, Subject Area, Shop Activity, and Assignments and Reference Study. A number appearing after each one designates the number in the school catalog under Electronics Technician.

Subject Area	Shop Activity	Assignments and Reference Study
Orientation School Rules and Organization Safety in Shop Safety Exam. Shop Rules and Organization Responsibilities of each Student Objectives of the Course	How to Tap and Thread-5 How to use Micrometer and Wire Guage-5	Write Report on Safety in the Shop
Hand Tools-5	How to use Hack Saw, Files and Chisles -5	
Power Tools-5 Demonstration	How to use Socket Punches and Reamers -5 Drilling-5	
Electronic Wiring-5 Soldering Methods of Soldering Demonstration Cabling Demonstration	Grinding-5 How to Tin and Care for the Soldering Iron-5 How to Make and Solder Connections-5	Read Information Sheet on Soldering and answer Questions
Schematics and Symbols-6	How to Prepare Wire for Soldering-5	References for Symbols: Henney: pages 11, 12, &13 TM 661: page 57 TM 681 page 227
Electron Theory-1 Structure of Matter Electrostatics	How to Make Splices-5 How to Lace Cabling-5	

Teaching Plan

Subject Area	Shop Activity	Assign. & Ref.
✓ Electron Theory(cont.) Principles of Electron Theory Demonstration of Charges Sources of Electricity	✓ Drawing of Schematics and Symbols-6	✓ TM 661: Read Chapters 2&3 pages 18 to 36 Study Questions end of Chapter, and be prepared to answer in class.
Student Panel Discussion* *Panel consists of three students, each assigned as an expert in a certain phase of previous material covered. Panel leads discussion and answers questions. Instructor corrects and fills in when nesces-sary.	✓ Layout Design-6	
	✓ How to Identify Components-6	
✓ Quiz	Performance Test--Art. Respir.	
First Aid Demonstration of Artificial Respiration	✓ How to Use Voltmeter, Ohmmeter and Ammeter-4	
✓ Arithematic Review-2	✓ How to Read Resistor Color Codes-1	✓ Cooke: Assignment Sheets for Chapters 2 to 5
✓ Units of Measurement-1 Demonstration of How to Read & Use Voltmeter & Ohmmeter	✓ How to Measure and Construct: Series Circuit-7 Parallel Circuit-7 Series-Parallel Circuit-7	✓ Henney: Chapter 2, pages 14 to 49, problems 46 to 48.
✓ Ohm's Law-1		
✓ Conditions Affecting Conduction-1	Performance Tests Use of Meters Measurements of DC Circuits	✓ TM 661: Chapters 4 to 9, prob. 1 to 8, on pages 108 to 111.
✓ Energy, Work, and Power-1		
✓ Introduction to Algebra-2		✓ Cooke: Assignment Sheets for Chap. 6 to 7
✓ Resistor Types & Color Codes-1		
✓ Series and Parallel Circuits-1		
✓ Series-Parallel Circuits-1		

Teaching Plan

Subject Area	Shop Activity	Assign. & Ref.
Panel Discussion	Connecting and Testing Batteries-7	
Quiz		Henney: Chap. 3, pages 50 to 65, prob. 4 to 11.
Batteries-1		
Algebra I-2	How to Extend Ranges of Meters-7	
Theory of Basic Meter-4		
Voltmeters-4 Ohmmeters-4 Ammeters-4 Demonstration Unit Used	How to Determine Meter Characteristics -7	Cooke: Assignment Sheets Chapters 8 to 10.
Algebra II		
Panel Discussion		
Quiz	How to Construct RC Circuits and Time Constants-3	TM 681: Chap. 3, pages 39 to 48 and 55 to 67.
Capacitance-3 Action of a Capacitor Unit of Capacitance Factors Which Affect Capac. Types and Construction Capacitance Checkers RC Time Constants	Operation and Use of Capacitance Checkers-4 How to Read Color Codes for Capacitors-3	Henney: Chapter 6, pages 116 to 134, prob. 1 to 19.
Panel Discussion	Electromagnetic Circuits-3	
Mid-Semester Exam.	How to Measure, Test and Use Relays-3	Cooke: Assign. Sheets Chapters 11 to 16
Algebra III		
Magnetism-3	Operation and Use of Inductance Bridge-4	TM 661: Chap. 1, 10, 11&12. pages 1 to 17 and 112 to 146, Study Ques. end of Chapter Answer in Class.
Electromagnetism-3 Demonstration	Practical Transformer Design-8	

Teaching Plan

Subject Area	Shop Activity	Assign. & Ref.
Electromagnetic Induction-3 Demonstration	How to Measure AC with a Meter-4	TM 681: Chap. 1, pages 1 to 16 Chap. 2, pages 17 to 22 and 30 to 34, answer ques. in Class.
AC & DC Generators-3	How to Read Color Codes of Transformers -8	
Values of Alternating Current and Voltage-3		
Meter Movements-4	Motor and Generator Connections-8	Henney: Chap. 4 & 5, pages 66 to 115, prob. chap.5 1 to 19.
Mutual Inductance-3		
Inductance and Inductors-3		
Practical Inductors-3		
Motors-3		
Panel Discussion		
Quiz	Operation of Oscilloscope Controls-4	
Basic Operation of Oscilloscope-4	How to Measure AC with an Oscilloscope-4	
Oscilloscope as an AC Voltmeter-4		
Algebra 1V-2	Construction and Testing of the following Circuits: -3 R-C-L Differentiating Intograting	Cooke: Assign. Sheets Chap. 17 to 19
History of the Vacuum Tube-9		
Electron Emission-9		
Construction of Diodes-9	Measuring Characteristics of Diode Vacuum Tubes-9	
Characteristics of Diodes-9		TM 662 Chapters 1 to 3 pages 1 to 39 review questions in Class.
Use of Tube Manuals-9		
Gaseous Rectifiers-9		

Teaching Plan

Subject Area	Shop Activity	Assign. & Ref.
Selenium and Dry Rectifiers-9	How to Construct and Test the Following Power Supplies:-14 Half-wave Full-wave Voltage Doublers and Multipliers Bridge	Henney: Chap. 10, pages 231 to 243 Chap. 12 omit Section 12.22 prob. 1 to 5 TM 662: Chap. 8, pages 144 to to 150
Panel Discussion		
Quiz		
Classification of Power Supplies-9 Half-wave Full-wave Voltage Doublers Bridge		
Filter Circuits-9 Filter Components and Their Action Types of Filter Circuits Load Considerations	How to Make Resistance and Voltage Checks in Filter Circuits-14	
Symptons Caused by Failures in Power Supplies.-9 Use of Oscilloscope and Multimeter for Diagnosing.	How to Use an Oscilloscope to Diagnose Troubles in Filter Circuits-14	
	How to Test Power Transformers-14	
	How to Check Dry Rectifiers-14	
	How to Diagnose Troubles to Individual Components-14	
Panel Discussion		Cooke: Assign. Sheets Chap. 22 to 26
Quiz		
Geometry and Trig.-2		
Types of Power Supplies-9 AC-DC Power Transformer Vibrator Dynamotor Battery Eliminators Batteries as a Source of Power	How to Construct and Test Vibrator Power Supplies-14	Assignment Sheet: Library reasearch on Vibrator Power Supplies.
	How to Test and Service Dynamotors-14	
Safety Requirements When Working on Power Supplies.-9		

Teaching Plan

Subject Area	Shop Activity	Assign. & Ref.
Vacuum Tube as an Amplifier-9 History and Development Triode Characteristics Demonstration Tetrodes and Pentodes Special Purpose Tubes Voltage Regulators Tube Checkers Use of Tube Manual	How to Record Characteristics of a Vacuum Tube-11 Construction of Basic Amplifier-11 Gas Tube Voltage Regulator-14 Complex Voltage Regulator-14 How to Use a Tube Checker-4 How to Use a Series Filament Tube Checker-4	TM 662: Chap. 4 & 5 pages 40 to 110 Ques. Chap. 5 Henney: Chap. 10 pages 244 to 255 prob. 1 to 5
Panel Discussion (include review) Semester Final Exam.		
Job Personality Los Angeles School Handbook on Job Information used as Reference.		Study Information on Job Per. answer ques.
Amplification-10 General Classifications Class Phase Relations Push-pull	Construction and Testing of the Following:-11 Triode Amplifier Power Amplifier Single Ended Push-Pull Pentode Voltage Amplifier	TM 662: Chap. 6 & 7 pages 111 to 143 review ques in class
Amplifiers-10 Classification According to Coupling Class. According to Use.	Incorporating Negative Feedback-11	Henney: Chap. 11, pages 256 to 295, prob. 1 to 4 and 14 to 15 Chap. 12 sec. 12.22 Chap. 13, pages 328 to 373
Phase Inverters-10 Compensation Circuits-10 Negative Feedback-10 Typical Audio Amplifier-10	Operation and Use of the Following Equipment:-4and 11 Audio Generators Audio AC meters Distortion Analyzers Oscilloscope Applications	
Audio Generators and Their Use-4		

Teaching Plan

Subject Area	Shop Activity	Assign. & Ref.
Demonstration: Static Measurements and trouble-shooting-4 & 10 Dynamic Measurements and trouble-shooting-4 & 10	How to Locate General Troubles in in Amplifiers-11	Cookes: Assign. Sheets Chap. 20 & 21
Frequency and Distortion Measurements -10	How to Check Frequency Response of Amplifiers-11	T.O. 16-1-195 Chap. 6, pages 127-131 Chap. 8, pages 236-246; 251-252 Chap. 9, pages 254-267; 277-297
Panel Discussion	How to Check % of Distortion in Amplifiers-11	
Quiz	How to Locate Distortion in Amplifiers -11	
✓Logarithms & Decibels-2 & 10	How to Measure Gain of Amplifiers-11	Hennoy: Chap. 21, pages 559-579
Advanced Oscilloscope Theory-4	How to Determine and Measure the Characteristics of an Oscilloscope-4	
Lissajous Figures-4 & 3	How to Use Lissajous Figures-3 & 4	
Vacuum Tube Voltmeter-4	How to Construct and Test the Following Oscilloscope Circuits:-4-11 -14 High Voltage Supplies Deflection Systems Video Amplifiers Sweep Circuits	Cookes: Assign. Sheets Chap. 27 to 30
Principles of AC Theory-3 Vector Analysis Inductive Reactance Capacitive Reactance Impedance Demonstration		TM 681 Chap.2, pages 22-30 Chap. 3, pages 47-55 Chap. 4, pages 71-88--answer Questions Chap. 5, pages 89-111
Characteristics of Resonant Circuits-3 Series and Parallel Resonance Tuned Circuits	Performance Test on Troubleshooting Oscilloscope-4	
Power in AC Circuits-3	How to Construct and Test the Following ing Circuits:-8 High and Low Pass Filters Band Pass Reactive Series and Parallel Resonant	Henney; Chap. 7,8,&9 pages 135-230
Safety Requirements to be Observed in AC Circuits-3		
Panel Discussion		
Quiz		

Teaching Plan

Subject Area	Shop Activity	Assign. & Ref.
Oscillators-10 General Oscillator Theory Types of Oscillators	Construction and Testing of the following: Audio Oscillators-11 RF Oscillators-11 Frequency Doublers-11 RF Power Amplifiers-11 Modulator-11	TM 662: Chap. 9, pages 155-164, answer questions. Chap. 10, pages 165-192, review ques. in class
Frequency Doublers-10		
Buffer and RF Power Amplifiers-10		
Amplitude Modulation-10	How to Tune a Transmitter-11	
Modulators-10		
AM Transmitters-10	How to Troubleshoot a Transmitter-11	Henney; Chap. 16 &17 pages 430-476
Demonstration of Tuning Transmitter		
Troubleshooting Transmitter-10		
Detection and Demodulator Circuits Diode Detection -12 Plate and Grid Detection Crystal Detection Automatic Volume Control	How to Constructe and Test Demodulator Circuits-15	TM 662: Chap. 8, pages 148-154 Henney: Chap. 14 pages 374-395
Round Discussion (include review)		
Mid-semester Exam.		
Tuned Radio Frequency (TRF) Receivers and R.F. Amplifiers-13	Construction of Simple Receiver-16	Henney: Chap. 15 pages 396-423
R.F. Signal Generators-4		
Demonstration of Alignment Procedure		
Heterodyne Theory-13	How to Align TRF Receiver-16	
Frequency Conversion-13		

Teaching Plan

Subject Area	Shop Activity	Assign. & Ref.
Superhetrodyne Receivers-13	Stage by Stage Hookup of Superhetrodyne Receiver-16	
Intermediate Frequency Amplifiers-13		Assignment Sheet Answer questions from research in Library
Crystal Mixers-13		
Demonstration of Alignment of a Superhetrodyne Receiver-16	How to Align Superhetrodyne Receiver-16	
Communication Receivers and Their Special Circuits-13		Henney: Chap. 15 pages 396-423
Discriminator Theory-13	How to Test Discrminators-16	
Automatic Frequency Control-13		
Theory of FM Transmission and Reception-12 Basic FM and PM Transmitters FM Detectors FM Receivers	How to Align FM Receiver-16	Henney: Chap. 19 pages 515-533
Demonstration: Alignment of FM Receiver-16		
	Testing Transistors-11	Henney: Chap. 15 pages 424-429
Additional Electronic Knowledge Theory and Use of Transistors Loudspeakers and Enclosures-10 Pickups and Microphones-10 Magnetic Reproduction-10 Preamplifiers and Equalization -10	Construction and Testing of Transistor Amplifier-11	
	Construction of Additional Transistor Circuit (students choice)-11	Assignment Sheet Questions for Research
	How to Operate Sound Control-11	
Panel Discussion		
General Review Class Participation in Outline of all Areas of The Course.		

Final Examinations
I. Written

II. Oral
Includes Interview for Guidance if Needed or Requested by Student

III. Performance Tests
Adjustments and Troubleshooting in Amplifiers, Oscillators, Oscilloscopes, Radios and Transmitters

Job Information
Types of Employment
Need for Specialization after Knowledge of Basic Electronics
Class Participation in a Job Interview
Need for References

TEXT REQUIREMENTS

Mathematics Essential to Electricity and Radio, Cooke and Orleans, McGraw-Hill

Principles of Radio, Henney and Richardson, Wiley & Sons, 6th edition.

Radar Electronic Fundamentals, T.O. 16-1-195, Navships 900,016, U.S. Gov. Printing Office.

Electrical Fundamentals (DC), TM-11661, U.S. Gov. Printing Office.

Electrical Fundamentals (AC), TM-11-681, U.S. Gov. Printing Office.

Basic Theory and Application of Electron Tubes, TM-11-662, U.S. Gov. Printing Office.

RCA Receiving Tube Manual, RCA

(or equivalent)

$\frac{200}{10}$ 20

$\frac{150}{10} = 15$

$\frac{250}{40} =$